Road Traffic Management Corporation

NATIONAL TRAFFIC indaba Durban '16

Cost of Road Traffic Crashes in South Africa

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1. Introduction

SOUTH AFRICA

Population: 52 776 130 • Income group: Middle • Gross national income per capita: US$ 7 190

INSTITUTIONAL FRAMEWORK	
Lead agency	Road Traffic Management Corporation
Funded in national budget	Yes
National road safety strategy	Yes
Funding to implement strategy	Partially funded
Fatality reduction target	50% (2011–2015)

SAFER ROADS AND MOBILITY	
Formal audits required for new road construction projects	Yes
Regular inspections of existing road infrastructure	Yes
Policies to promote walking or cycling	No
Policies to encourage investment in public transport	Yes
Policies to separate road users and protect VRUs	Yes

SAFER VEHICLES	
Total registered vehicles for 2013	9 909 923
Cars and 4-wheeled light vehicles	8 894 239
Motorized 2- and 3-wheelers	367 231
Heavy trucks	350 498
Buses	54 494
Other	243 461
Vehicle standards applied[a]	
Frontal impact standard	No
Electronic stability control	Yes
Pedestrian protection	Yes

[a] UNECE WP.29.

POST-CRASH CARE	
Emergency room injury surveillance system	No
Emergency access telephone numbers	Multiple numbers
Permanently disabled due to road traffic crash	—

DATA	
Reported road traffic fatalities (2010–2011)	13 802[b] (76% M, 24% F)
WHO estimated road traffic fatalities	13 273
WHO estimated rate per 100 000 population	25.1
Estimated GDP lost due to road traffic crashes	7.8%[c]

[b] Road Traffic Management Corporation. Defined as died within 30 days of crash.
[c] Road Traffic Management Corporation and iRAP (data from 2013).

SAFER ROAD USERS	
National speed limit law	Yes
Max urban speed limit	60 km/h
Max rural speed limit	100 km/h
Max motorway speed limit	120 km/h
Local authorities can modify limits	Yes
Enforcement	0 1 2 ③ 4 5 6 7 8 9 10
National drink–driving law	Yes
BAC limit – general population	< 0.05 g/dl
BAC limit – young or novice drivers	< 0.05 g/dl
Random breath testing carried out	Yes
Enforcement	0 1 2 3 ④ 5 6 7 8 9 10
% road traffic deaths involving alcohol	58%[d]
National motorcycle helmet law	Yes
Applies to drivers and passengers	Yes
Law requires helmet to be fastened	Yes
Law refers to helmet standard	No
Enforcement	0 1 2 3 4 ⑤ 6 7 8 9 10
Helmet wearing rate	—
National seat-belt law	Yes
Applies to front and rear seat occupants	Yes
Enforcement	0 1 ② 3 4 5 6 7 8 9 10
Seat-belt wearing rate	33% Drivers[e], 31% Front seats[f]
National child restraint law	No
Restrictions on children sitting in front seat	No
Child restraint law based on	—
Enforcement	—
% children using child restraints	—
National law on mobile phone use while driving	Yes
Law prohibits hand-held mobile phone use	Yes
Law also applies to hands-free phones	No
National drug-driving law	Yes

[d] National Injury Mortality Surveillance System (NIMSS) (data from 2010).
[e] Traffic Offence Survey RTMC (data from 2010).

- RTCs and the associated consequences are global concerns
- Pose a significant challenge to developing countries struggling to eradicate poverty
- South Africa has one of the highest fatality rates in the world
- RTCs, fatalities and injuries place an enormous burden on the South African society as well as the economy
- The burden of traffic system failures is measured in loss of human lives, pain and suffering as well as the increasing cost to the economy

2. Background

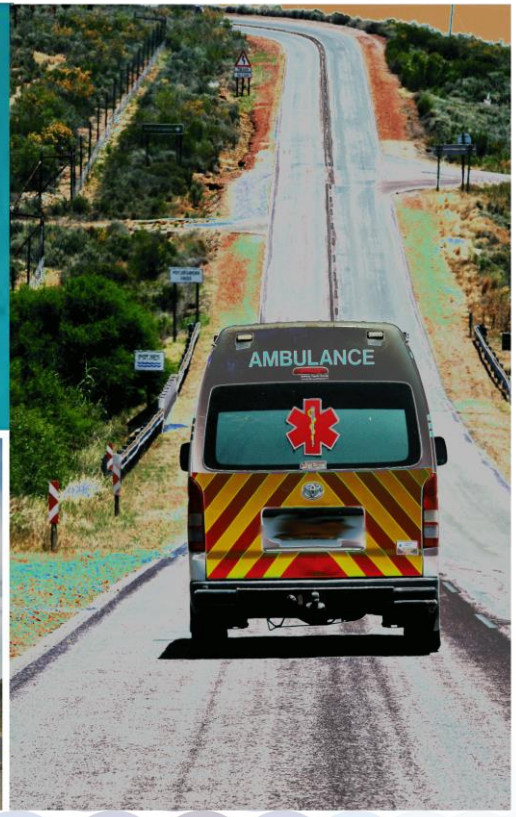
- 2003: DoT commissioned CSIR to develop a RTC costing methodology
- CoC 2004: include cost components illustrating socio-economic implications of RTCs on the families of victims
- CoC 2004: main reference for evaluations involving the costing of RTCs in South Africa
- 2015: Road Traffic Management Corporation (RTMC) commissioned the evaluation and review/update of CoC 2004

3. Project objectives

- Review and evaluate the CoC 2004
- Update unit cost tables based on CoC 2004
- Develop a revised/updated user-friendly methodology CoC 2016
- Methodology inclusive of social and indirect cost of crashes
- Determine cost of crashes 2016

4. Project overview

- User-friendly methodology, more appropriately account for the local realities of the social and indirect cost of RTCs
- Phase 1: update of the unit cost tables & benchmarking CoC 2004 against international practices
  - determine relevancy and inclusiveness
  - identification of additional variables for more comprehensive calculations
- Phase 2: develop a revised/updated methodology for estimating RTC costs for South Africa



5. Framework for CoC 2016

- Dependent on a consistent and reliable set of RTC data on a national level
- Good RTC recording systems and databases contain a plethora of data elements – bare essentials: severity of RTC and injuries; road user type, gender and age; RTC date and time; RTC type, location and road condition per RTC; type of vehicle(s) involved and contributory factors
- Recording of data should be at a high standard and of high integrity – credibility of CoC 2016 dependent on consistent, accurate, comprehensive and timely RTC database
- In the absence of this - need careful strategies to simulate RTC statistics as part of go forward
- Level of under-reporting of RTC is in South Africa not clear - take in consideration for simulated statistics

6. Results

- RTC statistics
- Severity of RTCs and under-reporting
- Human casualty unit costs
- Vehicle repair unit costs
- Incident unit costs
- Total cost of RTCs and by RTC severity
- Comparison with CoC 2004

6.1. RTC Statistics

The number of fatal RTCs and fatalities are recorded annually. From historical RTC data:

- ratio serious injuries/fatalities 4.6:1
- ratio slight injuries/fatalities 14.9:1

In 2015 12 944 people died in 10 613 fatal RTCs (RTMC 2016). Based on proportionalities:

- 59 069 serious injuries
- 191 331 slight injuries
- 263 241 total casualties
- 1 350 873 persons involved in RTCs not injured
- 71.2% of injured in RTCs male & 28.8% female

6.2. Severity and under reporting

- The number of traffic RTCs for 2015 was estimated using historical RTC trends
- This method indicated a ratio of major RTCs to fatal RTCs of 3.6:1
- The ratio for minor to fatal RTCs was 11.9:1 and for damage only RTCs 58.2:1
- It was estimated that a total of 792 791 RTCs occurred in 2015

Number of RTCs and casualties 2015, adjusted for underreporting (based on 5% for fatalities)					
	Fatal	**Major**	**Minor**	**Damage only**	**Total**
Number of RTCs	11 144	40 117	132 609	648 560	832 431
	Death	**Serious**	**Slight**	**No injury**	**Total**
Number of persons	13 591	62 520	202 509	1 429 794	1 708 414

6.3. Calculating the Cost of Crashes in South Africa 2015

Total cost of crashes 2015

142 951 Million Rand

Road Traffic Crash Statistics 2015

RTMC data for fatal crashes and fatalities 2015

2015 estimations:

- Major RTCs to fatal RTCs: 3.6:1
- Minor RTCs to fatal RTCs: 11.9:1
- Damage only to fatal RTCs: 58.2:1
- Serious injuries/ fatalities: 4.6:1
- slight injuries to/fatalities: 14.9:1

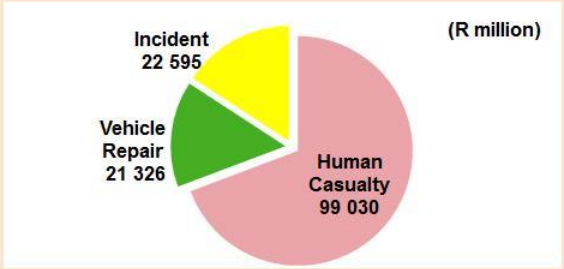
Severity of crashes 2015

Based on proportionalities (& adjusted for 5% under-reporting)

- Number of all crashes: 832 431
- Number of fatal crashes: 11 144
- Number major crashes: 40 117
- Number minor crashes: 132 609
- Number damage only crashes: 648 560

- Number of fatalities: 13 591
- Serious injuries: 62 520
- Slight injuries: 202 509
- Total Casualties: 278 620
- People involved RTCs not injured: 1 350 873
- Injured: 71.2% male
  28. 8 %female

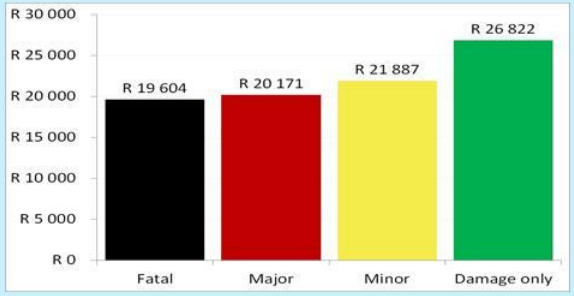
Total cost 2015 per category



RTCs Human casualty costs 2015

Rand	Fatal	Major	Minor	Damage
Lost productivity	R 2 878 177	R 217 253	R 29 504	R 2094
Pain/ suffer	R 2 123 994	R 287 173	R 47 509	
Medical treatment	R 147 143	R 110 656	R 32 681	
Funeral	R 16 613			
Workplace reoccupation	R 68 638	R 2 949		
Total	R 5 234 566	R 618 031	R 109 694	R 2094

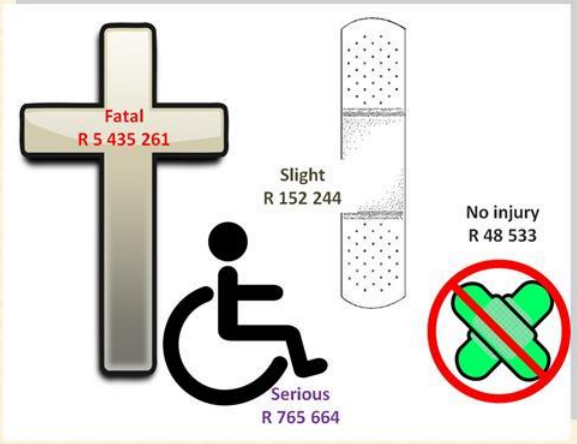
RTCs Vehicle repair costs 2015



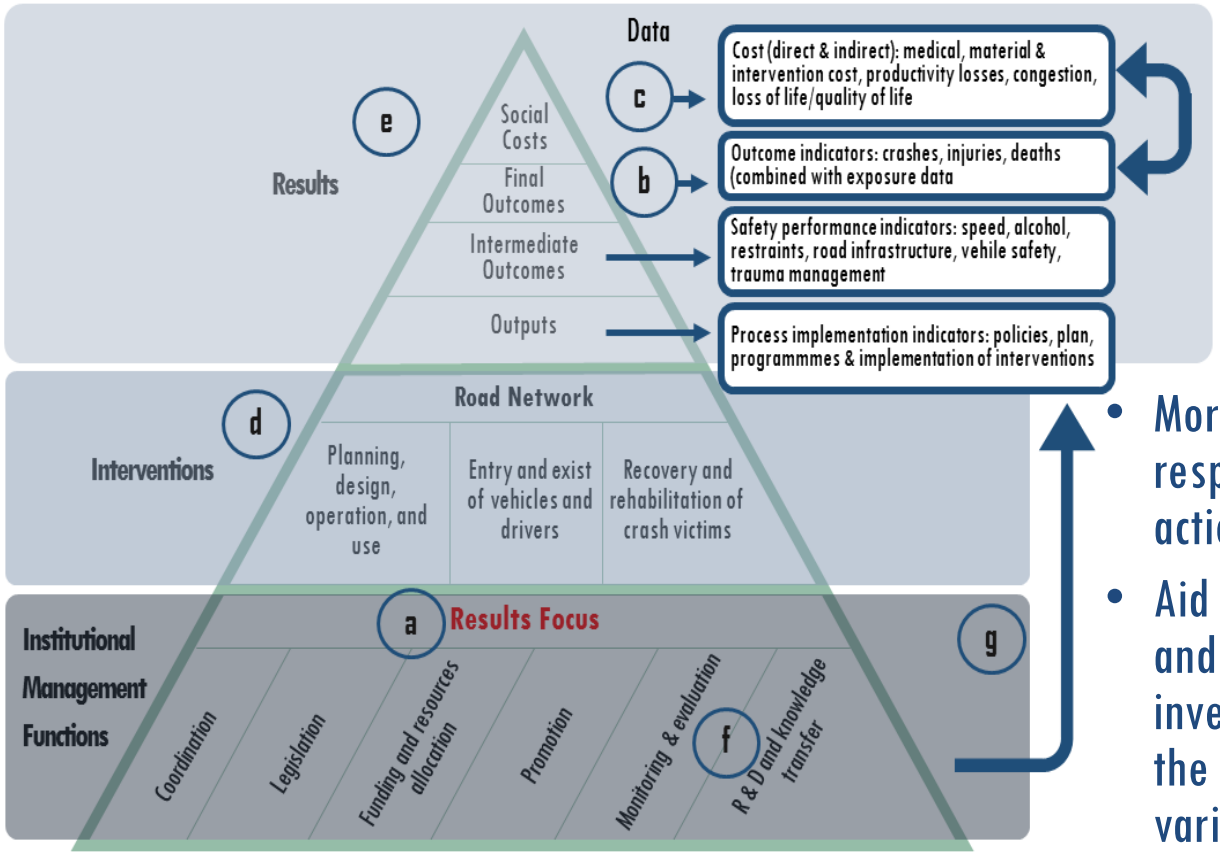
RTCs Incident cost 2015

	Fatal	Major	Minor	Damage
EMS	R 3 042	R 2 765		
Legal	R 101 623	R 101 623		
Vehicle related	R 3 107	R 3 197	R 3 469	R 4 251
RTC management	R 10 176	R 5 101	R 2 030	R 2 030
Infrastructure damage	R 1 596	R 1 637	R 2 023	R 2 508
Delay, congestion, emissions	R 61 547	R 13 140	R 13 140	R 10 829
Total	R 181 092	R 127 462	R 20 662	R 19 618

RTCs Unit cost per crash 2015



6.4. Conceptual user requirement specification



- URS to inform/guide the use of CoC 2016 estimations by a variety of users
- Monetising socio-economic burden of RTS failure on country level
- More tangible - differentiate responsibilities and accountabilities for actions
- Aid making the societal burden tangible and relatable to policy formation and investment - provide a clearer picture of the financial burden placed on the various sectors affected by RTCs

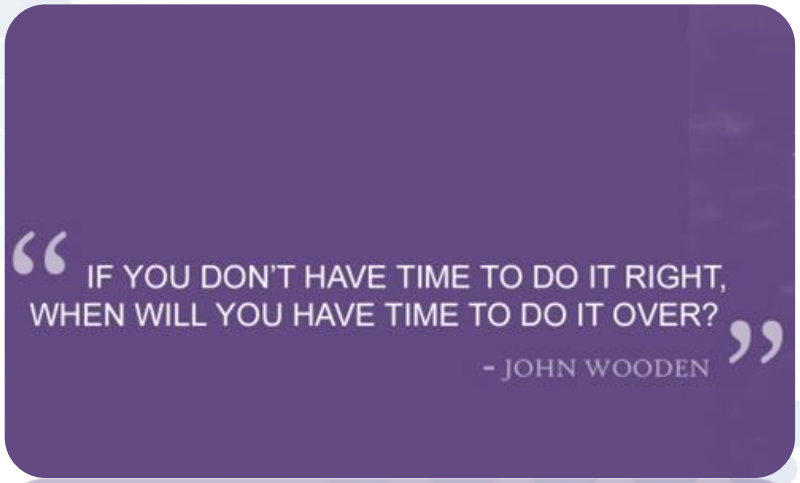
- Measure effective, accountable spending on interventions that effectively reduce RTCs and RTIs
- Cost-benefit analyses for selection & prioritisation of efficient countermeasures – monitoring & evaluation of their implementation

6. Application

- Understand the impact of RTCs on the economy and society of South Africa:
  - 2015 CoC amounted to almost R143 billion (3.4% of GDP)
  - 90% of RTC costs are incurred by road users/loved ones (direct expenditure or payment of insurance premiums or levies/impact physical or mental health/wellbeing)

- Benchmark South Africa's road traffic safety performance internationally:
  - Mindful that methods of calculating RTC costs differs from country to country
  - 3.4% of GDP - South Africa does not compare favourably with countries using similar methodologies
- Input into policy and strategy development to improve coordination and allocation of funds and other resources:
  - Expenditure on road safety improvements - What percentage of RTC costs should South Africa spend to reduce RTCs?
  - Expenditure and effort should be shared by all stakeholders
  - Resources and efforts should be put into the most cost-effective road safety improvement measures

Application



- Implementing evidence-based countermeasures effectively comes at a cost with high ROR
- Competition for resources - conduct benefit costs analyses before implementing any measures (get biggest bang for buck)
- Results from the RTC cost estimations can be used as input into a benefit cost analysis

- Examples:
  - Crash Modification Factors (CMFs) "measure of the estimated effectiveness of a safety countermeasure" - mostly with regard to engineering interventions
  - International B/C ratios indicate that RTCs can be reduced through implementing effective evidence-based human behaviour interventions
  - RTC unit cost rates useful to determine which projects, sites or routes should receive priority attention
  - Kilometres driven by particular modes of transport and the costs associated with RTCs involving these modes should be used to drive public transport policy decisions

Internalise CoC - example questions

Are you aware of the National Road Safety Strategy 2016?

In your jurisdiction, of the crashes that occur: How many fatalities & serious injuries?

What is the cost of attending to a crash scene?

- What is the cost in terms of fuel/km travelled to attend a scene?
- How much time is spent on the scene?
- What is the cost of filling out paper work?
- How many officers typically attend a scene?
- What is the combined cost of attending a crash scene?
- What is the cost of in-depth crash investigations?
- What is the cost in terms of overtime to the officer as well as the Department to attend the scene?
- What is the cost of congestion, e.g. in terms of CO_2 emissions and traffic delays?
- What is the cost of clearing the crash scene?
- What is the psychological and trauma cost to you as an attending officer?

- How does your municipality or authority budget for traffic crashes per year?
- How does your municipality or authority budget for road safety education and awareness?
- How does your municipality or authority decide on topics for road safety promotion and awareness?
- How do you measure your successes and failures?

HISTORY!

Safety rests in the future… One has to act now if the promise or hope is to be fulfilled later.
John Polya, 1964

Social Costs

Final Outcomes

Whoever wants to reach a distant goal must take many small steps. Helmut Schmidt, Former Chancellor of West Germany

Road crashes don't take holidays! The major crash causal factors during the holiday period are the same as the rest of the year: speed, alcohol intoxication and fatigue.

National Road Safety Strategy: *Too often, road safety is treated as a transportation issue, not a public health issue… many countries put far less effort into understanding and preventing road traffic injuries than they do into understanding and preventing diseases that do less harm.*
Dr Jong-Wook Lee, Director-General, WHO, 2004

Road Network

Improving the safety of roads is the single most significant achievable factor in reducing road trauma.

A car is not the only thing that can be recalled by its maker.

***T**he minutes*
***S**ome folks*
***S**ave through speed*
***T**hey never even*
***L**ive to need.*

…road traffic injuries now pose a global public health crisis that requires urgent action at the national and the international levels.
UN Secretary General, 2003

The road toll should not be accepted as inevitable.
The Australian National Road Safety Strategy 2001–2010

"Improving road safety requires strong political will on the part of governments. Countries should aim to ensure that sufficient resources are available, commensurate with the size of the road safety problem in their country.
Kofi Annan, UN Secretary-General, 2003

'Road Safety can be bought', but to determine what is a reasonable price to pay is not easy.

Michael Austin, 1966

7. Way forward

- Data collection
- Coordination
  - ‘RESULTS FOCUS’ - Achieving the desired focus on road safety results

Towards harnessing available data

- Facilitating the collection of additional RTC cost data
- Internationally injury statistics are being used to plan for the prevention of serious injuries due to traffic injuries within the context of the Safe System
- Australia: serious injury statistics (specifically head trauma and spinal cord injuries) are being utilised to redesign vehicles to include safety features that will prevent these life altering injuries (Pillar 3 safer vehicles)
- USA this statistics are used to address Pillar 2, design safer roads by identifying hazardous locations and treatments to prevent serious injuries
- The lack of serious injury data impacts on the accuracy of the methodology developed
- This research highlighted the need for multi-sectoral collaboration and synergistic coordination in order to harness available data to levels that will support evidence-based programmes and countermeasures
- This coordination needs to be headed by champion leadership with high level political support and sustained funding

Coordination to achieve data collaboration

- Estimations are that for every fatality, an estimated 15 more people get seriously injured - requiring hospitalisation and intensive care
- Many end up with permanent disabilities that curtail their potential productive lives with the need for life-long life support systems
- There is a need to quantify the cost of these injuries within the health system
- Currently there is no indication of what the cost of RTIs are in terms of resources needed to attend to these injuries - emergency room visits, hospital stays or the cost of rehabilitation and care afterwards - therefore very difficult to plan and allocate resources from a health care perspective - and to improve efficiencies and communicate the impact

Outputs

- **Improving road safety requires strong political will on the part of government - facilitating shared responsibility**
- Ensure that road safety is viewed to be a serious political issue – **143 billion Rand can be used a lot better!**
- Enforce safety laws already in existence/ including speed limits - **monitor compliance and evaluate success/failure**
- Enact and enforce legislation based on evidence **(cost per type of crash/road user etc.)**
- Stipulate requirements for the use of seat belts and motorcycle helmets, speed limits and the control of alcohol impaired driving based on evidence **(cost per type of crash/road user –contributing factors and cost of these crashes?)**

Outputs

- Ensure that road safety is embedded in environmental and other assessments for new projects and the analysis of transport policies and plans: **prioritise funding and projects according to importance**
- Establish data collection systems designed to collect, analyse and use data to improve safety.
- Create budget lines for road safety and increase investment in demonstrably effective road safety activities **(Cost of type of crash per type of road user- targeted audiences for promotion of road safety)**
- Establish appropriate design standards for roads that promote safety for all **(Cost of type of crash per type of road?)**
- Provide efficient, safe and affordable public transport services **(Cost of public transport crashes vs. driver training assessment/ promotion of public transport safety in terms of vehicles and people)**